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ABSTRACT

A total of 211 kindergarten children, aged 63 to 81 months, were classified into two groups according to the risk of failure in first grade predicted for them on the basis of their performance on the Wide Range Achievement Test (WRAT) and the Draw a Person (DAP) test. According to prediction, Group I children without intervention would probably fail at learning to read, and Group II children would read with no unusual difficulty. A diagnostic/prescriptive program was designed for each child in each group and implemented through the kindergarten year; however, Group I children received more intensive individualized attention than Group II children. At the end of the year the children were reassessed and reassigned to risk groups, and the data were compared to data obtained in other kindergartens. Results showed that risk status is related to level of development, but not to age or sex. There is tentative evidence to suggest that readiness for success in Grade 1 depends upon development as well as kindergarten training. Correlation between development and risk may point to reasons why (of the "at risk" children who profited most from prescriptive education in kindergarten) the boys performed at levels below those of their female classmates at the end of the year. Little variance in risk status was explained by DAP, which was negatively correlated with reading readiness and fine motor control. (GO)

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Reading Disabilities Prevention

In Five Year Olds

- A Case of Development X Treatment-Interaction -

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Children entering school at the kindergarten level represent a wide range of development, yet every child is presumed ready to learn to read when s/he enters first grade. The advent of an experimental kindergarten program in Area I of Portland's decentralized school district presented an opportunity to study the relationships of development, special treatment and readiness to learn to read. It is logical to expect that the more specifically early childhood education is addressed to each child's needs, the more effective it will be in preparing children for school.

The present study utilized the Wide Range Achievement Test (WRAT) plus clinical diagnosis as a means of predicting success in learning to read, and the Draw-A-Person (DAP) test as a measure of development. Children predicted to be at risk for learning to read were further diagnosed and received intensive individualized instruction in areas where it appeared to be needed. Children not predicted to be at risk received less intensive instruction but individualized activities were presented to them as needed.

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It was our dual purpose to discover the relationship of development to intensive kindergarten training and to assist the children deemed at risk to overcome their developmental lag. The report represents the first phase of a longitudinal study in which successive kindergarten groups will be assessed and treated, and the performance of these same children will be tested during their first grade experiences.

METHOD

Subjects

Children of kindergarten age enrolled in five experimental kindergartens were the subjects of this study. The children's ages ranged from 63 months to 81 months, and they participated in half-day kindergartens in Portland (Oregon) Public Schools during the regular school year 1973-74.

The kindergartens were all located in an area of Portland inhabited mainly by white working class families. Socioeconomic data indicate the essential similarity of the five schools; although three of the experimental schools qualified for Title I funds, the others were just barely ineligible at the time of the study, and have since become eligible. Morning or afternoon sessions were assigned on considerations of location and space rather than considerations of age, maturity or other child-related variables.

Procedures

All subjects attended half-day sessions at their kindergartens five days per week. Approximately two-thirds attended morning sessions and the remainder attended afternoons.

Participating children were tested at the beginning and end of the year for fine motor control, reading readiness, and at the beginning of the year for general maturity. The Wide Range Achievement Test (WRAT) was used

to determine reading readiness and fine motor control; the Draw-A-Person (DAP) test determined general maturity. On the basis of these tests and the clinical judgment of school psychologists, the diagnostic team classified the children into two groups:

Group 1 Children who without intervention would likely fail at learning to read.

Group 2 Children who in all likelihood would learn to read with no unusual difficulty.

Children who were placed in Group 1 after the initial screening were further examined by the diagnosticians. Procedures and activities designed to overcome the specific disabilities and difficulties of each child were then prescribed. Periodically throughout the school year, the children were observed and prescriptions altered as needed. Kindergarten teachers and aides utilized the prescribed activities and materials. An inservice class increased the teachers' abilities to follow the prescriptions. Children in Group 2 received similar but less intensive and less individualized attention.

At the end of the school year, the children were retested and reassigned to the risk groups. Gains in reading readiness and fine motor control were calculated for the children who were tested in both fall and spring. Within that group, correlations of sex, age, DAP, gain in reading readiness, gain in fine motor control and risk status were calculated.

RESULTS

Analysis of months of gain in reading readiness and fine motor control as measured by the WRAT, showed that at risk boys significantly outgained boys not at risk; girls at risk significantly outgained girls not at risk; girls at risk significantly outgained boys at risk. No significant differences in gains appeared between boys not at risk and girls not at risk.

Table I

Months Gain in Reading Readiness for Children in RDP-5 Kindergartens as Measured by Wide Range Achievement Test

Group	Number of Children	Mean Months Gain	Standard Deviation	Number of Children Remaining At Risk At Year End
Boys At Risk	38	8.3**#	5.1	12
Girls At Risk	33	9.1***#	4.7	8
Boys Not At Risk	65	5.9**	4.9	4
Girls Not At Risk	75	5.7***	4.6	1
All Boys	103	6.8	5.3	16
All Girls	108	6.8	4.9	9
TOTAL	211	6.8	5.0	25

** Boys at risk gained significantly more months than did boys not at risk ($p < .05$).

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Table I also shows that at year end 16 boys and 9 girls remained at risk according to the clinical judgment of the diagnosticians and the results of the WRAT. A Chi Square of the sex X risk relationship is not significant ($p > .05$). Of these, 4 boys and 1 girl had been classified as not at risk at the beginning of the year. These could have been the result of faulty testing and/or diagnosis at either end of the year.

Correlation of sex, age, DAP (as a measure of development), gain in reading readiness, gain in fine motor control and risk status revealed the point biserial relationship between DAP and risk category to be $r_{pb} = -0.23$ ($p < .01$). Other correlations to reach significance were between DAP and

age ($r = 0.24$, $p < .01$), DAP and gain in reading readiness ($r = -0.24$, $p < .01$), DAP and gain in fine motor control ($r = -0.18$, $p < .01$). Sex and gain in fine motor control showed a weaker relationship ($r = 0.13$, $p < .05$). The correlation between sex and DAP was nonsignificant, as was the correlation between sex and reading readiness and sex and risk status. All correlations were based on N = 160. (See Table II)

Table II

Correlation Coefficients for the Several Variables, Based on N = 160

	Age	DAP	Gain In Reading Readiness	Gain In Fine Motor Control	Risk Status
Sex	-.10	.03	.02	.13*	.10
Age		24**	-.11	-.11	.11
DAP			-.24**	-.18**	-.23**
Gain In Reading Readiness				.13*	-.02
Gain In Fine Motor Control					.01

* $p < .05$
** $p < .01$

Risk may be reasonably assumed to be a continuous variable dichotomized at a particular criterion for purposes of classification; hence justification exists for use of the biserial rather than the point biserial correlation. However, the distribution of risk is likely to be skewed, making interpretation of a biserial correlation tenuous. The biserial correlation

of DAP with risk reached r_b = -0.37. Because of the skew, this may be said to represent an upper limit of correlation for this study, with the true correlation lying between r = -0.23 and r = -0.37.

A follow-up WRAT was administered to those 66 children still available to us in January of their first grade experience. Table III shows these results, which indicate that the boys who were classified at risk in their kindergarten year still trail the boys not so classified, despite the larger gains made in their kindergarten year. The girls at risk in their kindergarten year appear to have caught up with their classmates.

Table III

Raw Scores & Standard Deviations Of
Wide Range Achievement Test Administered To
First Grade Children Who Had Been Classified
At Risk & Not At Risk in Their Kindergarten Year

Group	Number of Children	Mean Raw Score	Standard Deviation
At Risk			
Boys	21	21.38*	6.19
Girls	14	24.14	4.48
Not At Risk			
Boys	21	27.93	3.47
Girls	10	24.25	10.00

* $p < .05$

Unfortunately, no measure of development was administered at this time and therefore no statement of relationship between further development and learning to read can be made.

CONCLUSIONS

In this study, level of development appears to be related to risk status, whereas age is not directly related to risk status but is related to level of development as expressed in DAP. Gain in reading readiness and gain in fine motor control are negatively correlated with DAP, indicating perhaps a period of more rapid growth for those who were least mature upon entering kindergarten. Sex does not appear to be directly related to either DAP or risk status; however, a weak, spurious correlation of sex with age in this sample may be artificially obscuring any relationship between sex and DAP.

Although more evidence is needed for any degree of assurance, it seems reasonable that readiness for success in first grade depends upon development as well as kindergarten training. Those children in this study who appeared to be least mature seemed to profit most from the intensive diagnostic/prescriptive education they received, but some of them could not quite catch up prior to first grade, and of those who did, the boys still were not quite performing at the level of their classmates. Since the correlation between sex and risk status was not significant, but that between development and risk was, it would appear that only insofar as young boys are frequently less mature and develop slower age for age than young girls is there a sex-related factor.

Not much variance in risk status was explained by DAP (percent variance accounted for ranged from 5% to 14%); however, the evidence is sufficiently intriguing to warrant further study. Since explanations for these findings are developmental in nature, replication of the study using other measures of development, reading readiness and risk is under way to explore aspects of

development that might account more clearly for the results of the study. It would seem desirable to replicate the investigation in other kindergartens both within and outside this school district as well.

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